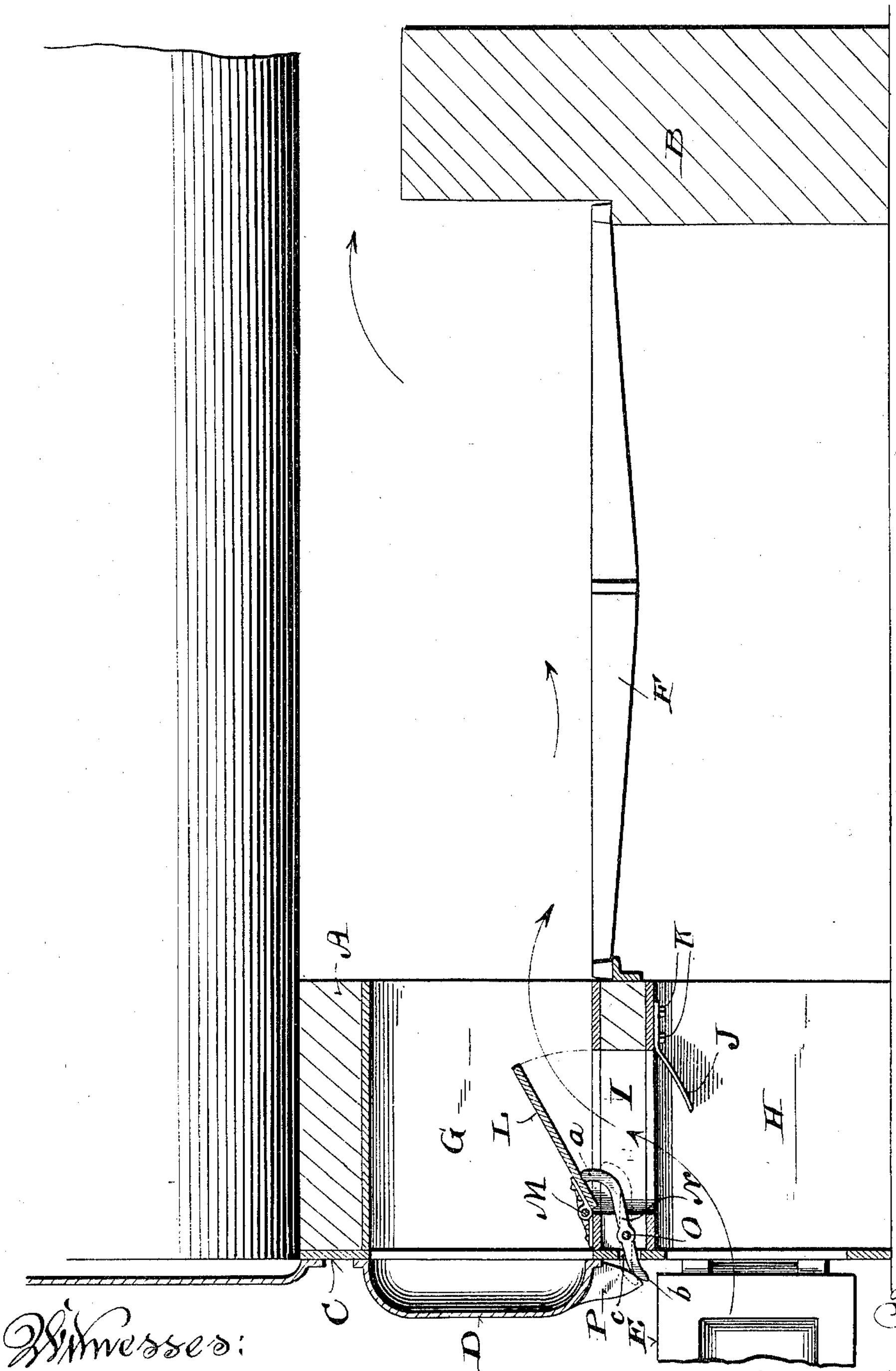
(No Model.)

W. HARRIS & F. A. BRANDT.

SMOKE CONSUMING FURNACE.

No. 600,199. Patented Mar. 8, 1898.



Witnesses:
Geo. W. Young.
B. C. Roloff

Inventors:
William Harris
Fredrick A. Brandt
By H. G. Underwood
Attorney.

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UNITED STATES PATENT OFFICE.

WILLIAM HARRIS AND FREDRICK A. BRANDT, OF MILWAUKEE, WISCONSIN.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 600,199, dated March 8, 1898.

Application filed October 4, 1897. Serial No. 653,913. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM HARRIS and FREDRICK A. BRANDT, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Smoke-Consuming Furnaces; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to devices for consuming the smoke and other gaseous products arising from the combustion of fuel in furnaces; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter and subsequently claimed.

The drawing represents a vertical longitudinal section taken through an ordinary steam-boiler furnace embodying our present invention.

Referring to the drawing, A represents the front wall, and B the bridge-wall, of an ordinary furnace.

C is the metallic front casing, D the fuel-door, and E the door to the ash-pit.

F represents the grate, which supports the fire-bed.

G is the opening in the front wall through which the coal is fed, and H the opening through which the ashes are removed. Ordinarily these openings are lined with solid metallic tops, bottoms, and sides; but in our present invention we provide a communicating passage-way I between the openings G and H, making the said passage-way preferably of the same width as that of the openings above and below the same, but of somewhat less depth or longitudinal extent. J is a hood or deflector also of the same width as that of the opening H, into which it projects, as shown, said deflector being preferably made of metal with its upper rear edge straight and secured to the roof of the ash-pit opening H, as by bolts K K. The described passage-way through the bottom wall of the opening G is covered by a door L, which completely closes the same and fits snugly, so that when down there is a smooth floor to said opening G, the said floor-door being hinged, as shown at M, close to the front of said floor.

N is a lever with a long inner arm upwardly curved at its end, as shown at *a*, so as to be in contact with the under side of the said door L near its hinged end. This lever is pivoted on a transverse shaft O, located near the front casing C, between the floor of the fuel-opening G and the roof of the ash-pit opening H, and the said front casing C is slotted in line with the shaft O, as shown at *c*, for the passage therethrough of the short outer arm of said lever N, which is beveled or bent downward at its end, as shown at *b*.

P is a beveled lug secured to and projecting downward from the base of the door D and in engagement with the said bent or beveled outer end of the said lever N when the door D is closed, as shown in the drawing.

The operation of our device will be readily understood from the foregoing description of its construction taken in connection with the accompanying drawing. When the fuel-door D is closed, the lug P will engage with the adjacent arm of the lever N and by depressing the same will raise the floor-door L of the opening G, and this raised door, in conjunction with the hood or deflector J, makes a flue or passage-way for the air from the outside entering through the front of the ash-pit opening H, (the door E, or else the dampers in said door, if that be preferred, being opened,) and said air becomes heated by its passage through said flue or passage-way and in its passage over the fire-bed and out over the bridge-wall B will mingle with the smoke and other products of combustion arising from the burning fuel and cause the same to be quickly and thoroughly consumed.

As the greater length of the floor-door L is beyond the line of the contact therewith of the inner end *a* of the lever N, the moment the fuel-door D is opened to replenish the supply of fuel on the grate the said floor-door L drops by its own gravity and closes the passage-way between the openings G and H.

Our device can be readily applied to existing furnaces at small expense as well as economically supplied to new furnaces in the course of erection and will be found extremely efficient in reducing the amount of smoke escaping from said furnaces to a minimum.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a smoke-consuming furnace, the com-

bination with the front wall having the usual fuel and ash-pit openings therein and doors closing the same, of a communicating passage-way between the said two openings, a hinged floor-door closing said passage-way, a pivoted lever having one end in contact with the under side of said floor-door adjacent to the hinged end thereof, and the other end projecting out beyond the said front wall, and a projection on the fuel-door adapted to engage with said projecting end of the lever and raise the said floor-door when the fuel-door is closed.

2. In a smoke-consuming furnace, the combination with the front wall having the usual fuel and ash-pit openings therein and doors closing the same, of a communicating passage-way between the said two openings, a hinged floor-door closing said passage-way flush with the balance of the floor of said fuel-opening, a pivoted lever located between the said two openings and having a curved upward-extending inner end in contact with the under side of said floor-door adjacent to the hinged end thereof and a downward bent or beveled outer end projecting through the said front wall, a projection on the fuel-door adapted to engage with said projecting lever end and raise the said floor-door when the fuel-door is closed, and a hood or deflector secured to the roof of the ash-pit opening beyond the said passage-way and projecting obliquely downward beneath said passage-way toward the ash-pit door, said floor-door and hood or deflector being of the same width as that of the openings in which they project, whereby a flue or passage-way is formed thereof, when the floor-door is raised, for outside air from the front of the ash-pit opening to and over the fire-bed of the furnace, and whereby when the fuel-door is opened the said floor-door will close by gravity.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

WILLIAM HARRIS.
FREDRICK A. BRANDT.

Witnesses:
H. G. UNDERWOOD,
B. C. ROLOFF.